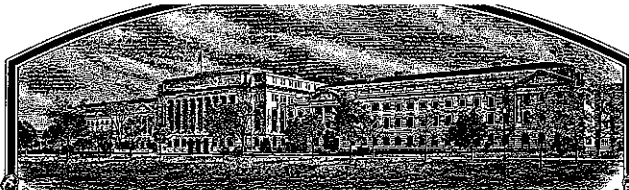


No.

200500005



THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

South Dakota Agricultural Experiment Station

Whereas, THERE HAS BEEN PRESENTED TO THE

Secretary of Agriculture

AN APPLICATION REQUESTING A CERTIFICATE OF PROTECTION FOR AN ALLEGED DISTINCT VARIETY OF SEXUALLY REPRODUCED, OR TUBER PROPAGATED PLANT, THE NAME AND DESCRIPTION OF WHICH ARE CONTAINED IN THE APPLICATION AND EXHIBITS, A COPY OF WHICH IS HEREUNTO ANNEXED AND MADE A PART HEREOF, AND THE VARIOUS REQUIREMENTS OF LAW IN SUCH CASES MADE AND PROVIDED HAVE BEEN COMPLIED WITH, AND THE TITLE THERETO IS, FROM THE RECORDS OF THE PLANT VARIETY PROTECTION OFFICE, IN THE APPLICANT(S) INDICATED IN THE SAID COPY, AND WHEREAS, UPON DUE EXAMINATION MADE, THE SAID APPLICANT(S) IS (ARE) ADJUDGED TO BE ENTITLED TO A CERTIFICATE OF PLANT VARIETY PROTECTION UNDER THE LAW.

NOW, THEREFORE, THIS CERTIFICATE OF PLANT VARIETY PROTECTION IS TO GRANT UNTO THE SAID APPLICANT(S) AND THE SUCCESSORS, HEIRS OR ASSIGNS OF THE SAID APPLICANT(S) FOR THE TERM OF TWENTY YEARS FROM THE DATE OF THIS GRANT, SUBJECT TO THE PAYMENT OF THE REQUIRED FEES AND PERIODIC REPLENISHMENT OF VIABLE BASIC SEED OF THE VARIETY IN A PUBLIC REPOSITORY AS PROVIDED BY LAW, THE RIGHT TO EXCLUDE OTHERS FROM SELLING THE VARIETY, OR OFFERING IT FOR SALE, OR REPRODUCING IT, OR IMPORTING IT, OR EXPORTING IT, OR CONDITIONING IT FOR PROPAGATION, OR STOCKING IT FOR ANY OF THE ABOVE PURPOSE, OR CONDITIONING IT FOR PROPAGATION, OR STOCKING IT FOR ANY OF THE ABOVE PURPOSE, OR USING IT IN PRODUCING A HYBRID OR DIFFERENT VARIETY THEREFROM, TO THE EXTENT PROVIDED BY THE PLANT VARIETY PROTECTION ACT. IN THE UNITED STATES SEED OF THIS VARIETY (1) SHALL BE SOLD BY VARIETY NAME ONLY AS A CLASS OF CERTIFIED SEED AND (2) SHALL CONFORM TO THE NUMERICAL GENERATIONS SPECIFIED BY THE OWNER OF THE RIGHTS. (84 STAT. 1542, AS AMENDED, 7 U.S.C. 2321 ET SEQ.)

WHEAT, COMMON

'Granger'

In Testimony Whereof, I have hereunto set my hand and caused the seal of the Plant Variety Protection Office to be affixed at the City of Washington, D.C. this twenty-first day of March, in the year two thousand and five.

Attest:

Commissioner
Plant Variety Protection Office
Agricultural Marketing Service



[Signature]

Secretary of Agriculture

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
SCIENCE AND TECHNOLOGY - PLANT VARIETY PROTECTION OFFICE

APPLICATION FOR PLANT VARIETY PROTECTION CERTIFICATE
(Instructions and information collection burden statement on reverse)

The following statements are made in accordance with the Privacy Act of 1974 (5 U.S.C. 552a) and the Paperwork Reduction Act (PRA) of 1995.

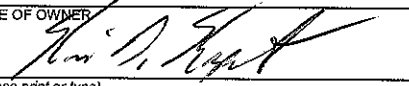
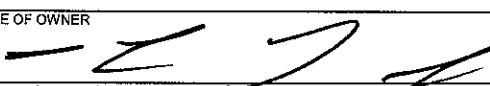
Application is required in order to determine if a plant variety protection certificate is to be issued (7 U.S.C. 2421). Information is held confidential until certificate is issued (7 U.S.C. 2426).

1. NAME OF OWNER South Dakota Agricultural Experiment Station		2. TEMPORARY DESIGNATION OR EXPERIMENTAL NAME SD3546	3. VARIETY NAME Granger
4. ADDRESS (Street and No., or R.F.D. No., City, State, and ZIP Code, and Country) South Dakota State University AGH 129 Brookings SD 57007		5. TELEPHONE (include area code) (605) 688-4149	FOR OFFICIAL USE ONLY PVPO NUMBER 2005 00005 FILING DATE October 12, 2004
		6. FAX (include area code) (605) 688-6065	
7. IF THE OWNER NAMED IS NOT A "PERSON", GIVE FORM OF ORGANIZATION (corporation, partnership, association, etc.) Agricultural Experiment Station	8. IF INCORPORATED, GIVE STATE OF INCORPORATION	9. DATE OF INCORPORATION	
10. NAME AND ADDRESS OF OWNER REPRESENTATIVE(S) TO SERVE IN THIS APPLICATION. (First person listed will receive all papers) Dr. Kevin D. Kephart, Director SD Ag Experiment Station Box 2207 SDSU Brookings SD 57007		Dr. Karl Glover Spring Wheat Breeder Plant Science Dept. NPB 247 SDSU Brookings SD 57007	
11. TELEPHONE (include area code) (605-688-4769)	12. FAX (include area code) 605-688-4452	13. E-MAIL Karl_Glover@sdstate.edu	
14. CROP KIND (Common Name) TRITICUM AESTIVUM L	16. FAMILY NAME (Botanical) GRAMINEAE	18. DOES THE VARIETY CONTAIN ANY TRANSGENES? (OPTIONAL) <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO IF SO, PLEASE GIVE THE ASSIGNED USDA-APHIS REFERENCE NUMBER FOR THE APPROVED PETITION TO DEREGULATE THE GENETICALLY MODIFIED PLANT FOR COMMERCIALIZATION.	
15. GENUS AND SPECIES NAME OF CROP Common wheat	17. IS THE VARIETY A FIRST GENERATION HYBRID? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	20. DOES THE OWNER SPECIFY THAT SEED OF THIS VARIETY BE SOLD AS A CLASS OF CERTIFIED SEED? (See Section 83(a) of the Plant Variety Protection Act) <input checked="" type="checkbox"/> YES (If "yes", answer items 21 and 22 below) <input type="checkbox"/> NO (If "no", go to item 23)	
19. CHECK APPROPRIATE BOX FOR EACH ATTACHMENT SUBMITTED (Follow instructions on reverse)		21. DOES THE OWNER SPECIFY THAT SEED OF THIS VARIETY BE LIMITED AS TO NUMBER OF CLASSES? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO IF YES, WHICH CLASSES? <input type="checkbox"/> FOUNDATION <input type="checkbox"/> REGISTERED <input type="checkbox"/> CERTIFIED	
a. <input checked="" type="checkbox"/> Exhibit A. Origin and Breeding History of the Variety b. <input checked="" type="checkbox"/> Exhibit B. Statement of Distinctness c. <input checked="" type="checkbox"/> Exhibit C. Objective Description of Variety d. <input checked="" type="checkbox"/> Exhibit D. Additional Description of the Variety (Optional) e. <input checked="" type="checkbox"/> Exhibit E. Statement of the Basis of the Owner's Ownership f. <input checked="" type="checkbox"/> Voucher Sample (2,500 viable untreated seeds or, for tuber propagated varieties, verification that tissue culture will be deposited and maintained in an approved public repository) g. <input checked="" type="checkbox"/> Filing and Examination Fee (\$3,652), made payable to "Treasurer of the United States" (Mail to the Plant Variety Protection Office)		22. DOES THE OWNER SPECIFY THAT SEED OF THIS VARIETY BE LIMITED AS TO NUMBER OF GENERATIONS? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO IF YES, SPECIFY THE NUMBER 1,2,3, etc. FOR EACH CLASS. <input type="checkbox"/> FOUNDATION <input type="checkbox"/> REGISTERED <input type="checkbox"/> CERTIFIED (If additional explanation is necessary, please use the space indicated on the reverse.)	
23. HAS THE VARIETY (INCLUDING ANY HARVESTED MATERIAL) OR A HYBRID PRODUCED FROM THIS VARIETY BEEN SOLD, DISPOSED OF, TRANSFERRED, OR USED IN THE U. S. OR OTHER COUNTRIES? <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO 3/1/04 USA IF YES, YOU MUST PROVIDE THE DATE OF FIRST SALE, DISPOSITION, TRANSFER, OR USE FOR EACH COUNTRY AND THE CIRCUMSTANCES. (Please use space indicated on reverse.)		24. IS THE VARIETY OR ANY COMPONENT OF THE VARIETY PROTECTED BY INTELLECTUAL PROPERTY RIGHT (PLANT BREEDER'S RIGHT OR PATENT)? <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO IF YES, PLEASE GIVE COUNTRY, DATE OF FILING OR ISSUANCE AND ASSIGNED REFERENCE NUMBER. (Please use space indicated on reverse.)	

25. The owners declare that a viable sample of basic seed of the variety has been furnished with application and will be replenished upon request in accordance with such regulations as may be applicable, or for a tuber propagated variety a tissue culture will be deposited in a public repository and maintained for the duration of the certificate.

The undersigned owner(s) is(are) the owner of this sexually reproduced or tuber propagated plant variety, and believe(s) that the variety is new, distinct, uniform, and stable as required in Section 42, and is entitled to protection under the provisions of Section 42 of the Plant Variety Protection Act.

Owner(s) is (are) informed that false representation herein can jeopardize protection and result in penalties.

SIGNATURE OF OWNER 		SIGNATURE OF OWNER 	
NAME (Please print or type) Dr. Kevin D. Kephart		NAME (Please print or type) Dr. Karl Glover	
CAPACITY OR TITLE Director, SDAES	DATE 9-30-2004	CAPACITY OR TITLE Spring Wheat Breeder	DATE 9/30/2004

(See reverse for instructions and information collection burden statement)

GENERAL: To be effectively filed with the Plant Variety Protection Office (PVPO), **ALL** of the following items must be **received** in the PVPO: (1) Completed application form signed by the owner; (2) completed exhibits A, B, C, E; (3) for a seed reproduced variety at least 2,500 viable untreated seeds, for a hybrid variety at least 2,500 untreated seeds of each line necessary to **reproduce** the variety, or for tuber reproduced varieties verification that a viable (*in the sense that it will reproduce an entire plant*) tissue culture will be deposited and maintained in an approved public repository; (4) check drawn on a U.S. bank for \$3,652 (\$432 filing fee and \$3,220 examination fee), payable to "Treasurer of the United States" (See Section 97.6 of the Regulations and Rules of Practice.) Partial applications will be held in the PVPO for not more than 90 days, then returned to the applicant as unfilled. Mail application and other requirements to Plant Variety Protection Office, AMS, USDA, Room 401, NAL Building, 10301 Baltimore Avenue, Beltsville, MD 20705-2351. Retain one copy for your files. All items on the face of the application are self explanatory unless noted below. Corrections on the application form and exhibits must be initialed and dated. **DO NOT** use masking materials to make corrections. If a certificate is allowed, you will be requested to send a check payable to "Treasurer of the United States" in the amount of \$432 for issuance of the certificate. Certificates will be issued to owner, not licensee or agent.

Plant Variety Protection Office

Telephone: (301) 504-5518

FAX: (301) 504-5291

Homepage: <http://www.ams.usda.gov/science/pvpo/pvpindex.htm>

To avoid conflict with other variety names in use, the applicant must check the appropriate recognized authority and provide evidence that name has been cleared by the appropriate recognized authority before the Certificate of Protection is issued. For example, for agricultural and vegetable crops, contact: Seed Branch, AMS, USDA, 10301 Baltimore Avenue, Suite 401 NAL Building, Beltsville, MD 20705. Telephone: (301) 504-5682 <http://www.ams.usda.gov/lsg/seed.htm>.

ITEM

- 19a. Give: (1) the genealogy, including public and commercial varieties, lines, or clones used, and the breeding method; (2) the details of subsequent stages of selection and multiplication; (3) evidence of uniformity and stability; and (4) the type and frequency of variants during reproduction and multiplication and state how these variants may be identified
- 19b. Give a summary of the variety's distinctness. Clearly state how this application variety may be distinguished from all other varieties in the same crop. If the new variety is most similar to one variety or a group of related varieties:
- (1) identify these varieties and state all differences objectively;
 - (2) attach statistical data for characters expressed numerically and demonstrate that these are clear differences; and
 - (3) submit, if helpful, seed and plant specimens or photographs (prints) of seed and plant comparisons which clearly indicate distinctness.
- 19c. Exhibit C forms are available from the PVPO Office for most crops; specify crop kind. Fill in Exhibit C (Objective Description of Variety) form as completely as possible to describe your variety.
- 19d. Optional additional characteristics and/or photographs. Describe any additional characteristics that cannot be accurately conveyed in Exhibit C. Use comparative varieties as is necessary to reveal more accurately the characteristics that are difficult to describe, such as plant habit, plant color, disease resistance, etc.
- 19e. Section 52(5) of the Act requires applicants to furnish a statement of the basis of the applicant's ownership. An Exhibit E form is available from the PVPO.
20. If "Yes" is specified (*seed of this variety be sold by variety name only, as a class of certified seed*), the applicant **MAY NOT** reverse this affirmative decision after the variety has been sold and so labeled, the decision published, or the certificate issued. However, if "No" has been specified, the applicant may change the choice. (See Regulations and Rules of Practice, Section 97.103).
23. See Sections 41, 42, and 43 of the Act and Section 97.5 of the regulations for eligibility requirements.
24. See Section 55 of the Act for instructions on claiming the benefit of an earlier filing date.

22. CONTINUED FROM FRONT (Please provide a statement as to the limitation and sequence of generations that may be certified.)

23. CONTINUED FROM FRONT (Please provide the date of first sale, disposition, transfer, or use for each country and the circumstances, if the variety (including any harvested material) or a hybrid produced from this variety has been sold, disposed of, transferred, or used in the U.S. or other countries.)

24. CONTINUED FROM FRONT (Please give the country, date of filing or issuance, and assigned reference number, if the variety or any component of the variety is protected by intellectual property right (Plant Breeder's Right or Patent).)

NOTES: It is the responsibility of the applicant/owner to keep the PVPO informed of any changes of address or change of ownership or assignment or owner's representative during the life of the application/certificate. The fees for filing a change of address; owner's representative; ownership or assignment; or any modification of owner's name is specified in Section 97.175 of the regulations. (See Section 101 of the Act, and Sections 97.130, 97.131, 97.175(h) of the Regulations and Rules of Practice.)

According to the Paperwork Reduction Act of 1995, an agency may not conduct or sponsor, and a person is not required to respond to a collection of information unless it displays a valid OMB control number. The valid OMB control number for this information collection is 0581-0055. The time required to complete this information collection is estimated to average 1.4 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, gender, religion, age, disability, sexual orientation, marital or family status, political beliefs, parental status, or protected genetic information. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at 202-720-2600 (voice and TDD).

To file a complaint of discrimination, write USDA, Director, Office of Civil Rights, Room 326-W, Whitten Building, 14th and Independence Avenue, SW, Washington, DC 20250-9410 or call 202-720-5964 (voice and TDD). USDA is an equal opportunity provider and employer.

EXHIBIT A
Granger (SD3546)
Origin and Breeding History of the Variety

'Granger' is an F_4 derived line from the two-parent cross 'SD8070/SD3165' made at Brookings, South Dakota in the fall of 1993. SD8070 was developed from the cross 'Guard'/'Sharp' and SD3165 originated from the cross 'Butte 86'/3/Mexico Dwarf/Baca/Vona/4/PR2375.

. The F_1 plants were grown at Yuma, Arizona during the winter of 1994-1995. Individual F_2 plant selections were made at Brookings, South Dakota in 1995 and were grown at Yuma the following winter (1995-96) as plant rows. Plant rows at Yuma were harvested individually and used to sow $F_{2.4}$ yield trials at Aurora and South Shore, SD in 1996. Based on data collected from the 1996 yield trials, individual plant selections from within the population were advanced once again to the Yuma nursery and sown as $F_{4.5}$ lines during the winter of 1996-97. The population was selected for advancement based on grain yield, grain volume weight, and bread-making characteristics. Individual plants were visually selected for resistance to prevalent foliar pathogens (*i.e.*, leaf and stem rust). Two single plant rows from this population were selected at Yuma and brought back to SD for further testing as $F_{4.6}$ lines during the 1997 growing season. Based on the yield performance grain volume weight, bread-making characteristics, and disease resistance, one of the lines from within this population was promoted to its first year of replicated statewide yield trials in 1998 with an experimental designation of SD3546. Seed was purified and increased by the South Dakota Spring Wheat Breeding Program from 2000 through 2002. Breeders' seed was produced in 2002 and Foundation seed was produced in 2003.

Granger was tested within the South Dakota State University Spring Wheat Breeding Program Advanced Yield Trials from 2000 through 2003. It has also been tested in 2001 and 2002 by our state Crop Performance Trial (CPT) group. Additionally, it was included in the Uniform Regional Spring Wheat Nursery from 2001 to 2003. Granger was tested by the Wheat Quality Council (WQC) in 2003.

Granger has been observed for five generations of reproduction and during the seed increase period. It was noted as stable and uniform. No variants were observed.

EXHIBIT B
Granger (SD3546)
Statement of Distinctness

Our records indicate that Granger is most similar to 'Briggs', 'Walworth', 'Russ', and 'Oxen'. Analysis of several agronomic characters, as well as Polyacrylamide Gel Electrophoresis, (PAGE) reveal that Granger is unique in comparison to these four varieties.

Grain Yield: Based on analysis of yield data collected from 2000 to 2003 over 30 South Dakota locations, Granger produced significantly higher grain yield than Oxen and Walworth (Table 1). During the four-year period, however, its grain yield was not significantly higher than that of Briggs and Russ (Table 1).

Test Weight: Based on analysis of data collected from 2000 to 2003 over 30 South Dakota locations, Granger produced grain with a significantly higher test weight than the four varieties it was compared with (Table 2).

Plant Height: Based on analysis of plant height data collected from 2000 to 2003 over 30 South Dakota locations, Granger was found to be significantly taller than all varieties it was compared against except Russ (Table 3).

Heading Date: Based on analysis of data for heading date that was collected from 2000 to 2003 over 30 South Dakota locations, Granger was found to be significantly later than Briggs, similar to Walworth, and significantly earlier than both Russ and Oxen (Table 4).

PAGE: Revealed that Granger is unique to all four varieties in which it is being compared by at least three protein bands (Figure 1). The original photograph of this PAGE gel is on file at the South Dakota State University Seed Testing Laboratory; Plant Science Department; Ag Hall 240; P.O. Box 2207-A; Brookings, SD 57007-1096; Phone: (605) 688-4589; FAX: (605) 688-4013

Table 1. Yield (bu/ac) comparisons among five hard red spring wheat varieties tested from 2000 to 2003 in South Dakota State University Advanced Yield Trials.

Year	2000	2001	2002	2003	'00-'03
Locations	9	8	6	7	30
Entry					
Granger	46.32	49.34	37.78	60.16	48.55
Briggs	49.79	49.06	36.86	59.47	49.00
Walworth	44.78	44.80	33.67	59.56	45.87
Russ	45.47	48.59	35.72	59.62	47.55
Oxen	46.26	49.30	35.31	55.58	46.94
CV	9.44	9.43	8.00	8.66	12.15
LSD	2.18	2.39	1.69	2.96	1.58

Table 2. Test weight (lb/bu) comparisons among five hard red spring wheat varieties tested from 2000 to 2003 in South Dakota State University Advanced Yield Trials.

Year	2000	2001	2002	2003	'00-'03
Locations	9	8	6	7	30
Entry					
Granger	59.17	58.55	56.87	59.27	58.45
Briggs	58.97	54.12	55.31	57.48	56.21
Walworth	58.46	56.51	55.34	57.25	56.82
Russ	57.46	54.41	55.35	57.54	56.03
Oxen	57.63	56.04	55.48	56.84	56.43
CV	10.59	5.10	3.02	2.00	5.96
LSD	4.17	1.55	1.05	0.71	1.04

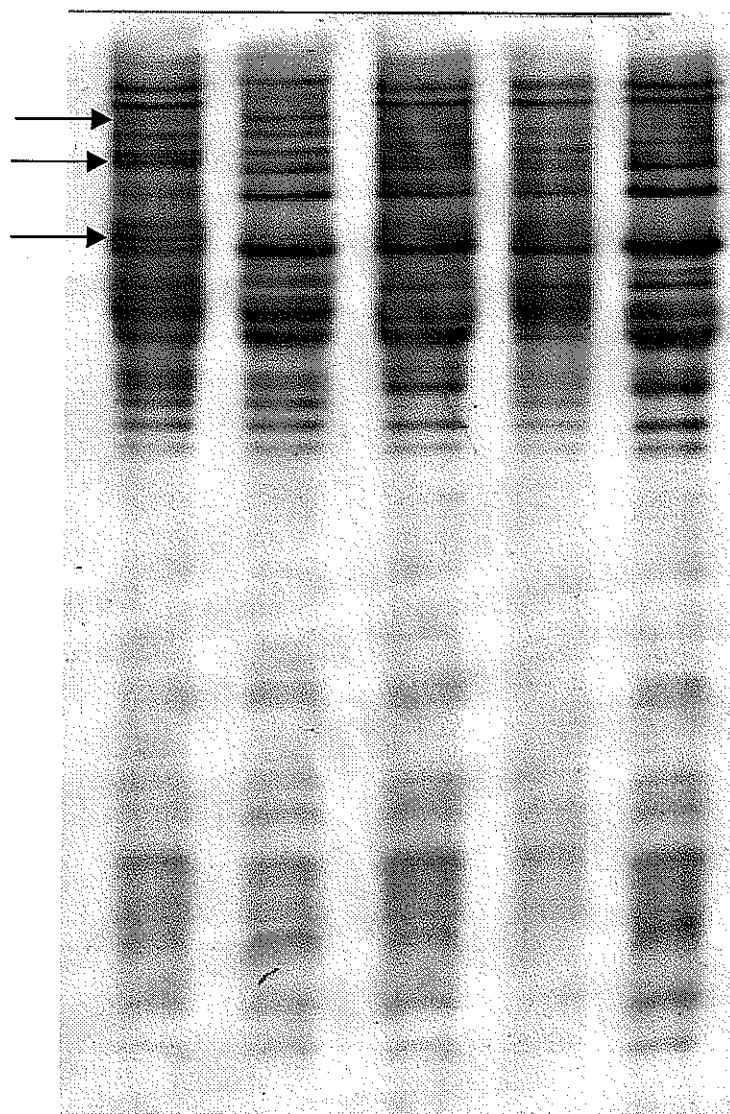
Table 3. Plant height (cm) comparisons among five hard red spring wheat varieties tested from 2000 to 2003 in South Dakota State University Advanced Yield Trials.

Year	2000	2001	2002	2003	'00-'03
Locations	9	8	6	7	30
Entry					
Granger	84.67	80.65	70.94	76.58	78.25
Briggs	78.38	77.30	70.47	75.42	75.64
Walworth	80.00	76.90	70.18	76.50	76.12
Russ	83.23	78.35	71.74	77.58	78.01
Oxen	77.52	73.55	65.71	69.08	72.07
CV	4.41	5.44	4.43	4.15	5.33
LSD	2.23	2.69	2.15	2.56	1.39

Table 4. Heading date (day of year) comparisons among five hard red spring wheat varieties tested from 2000 to 2003 in South Dakota State University Advanced Yield Trials.

Year	2000	2001	2002	2003	'00-'03
Locations	9	8	6	7	30
Entry					
Granger	167.29	176.71	172.52	170.67	171.65
Briggs	166.19	176.58	172.00	171.11	171.18
Walworth	166.72	176.47	172.71	170.88	171.50
Russ	168.33	178.05	174.00	172.55	173.01
Oxen	167.71	177.52	172.94	172.22	172.34
CV	3.14	0.54	0.52	0.36	0.64
LSD	3.21	0.65	0.62	0.61	0.39

Figure 1. Polyacrylamide Gel Electrophoresis (PAGE) gel of hard red spring wheat cultivars Granger, Briggs, Walworth, Russ, and Oxen presented in the same order.



REPRODUCE LOCALLY. Include form number and date on all reproductions.

Form Approved - OMB No. 0581-0055

Instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information.

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U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
SCIENCE AND TECHNOLOGY
PLANT VARIETY PROTECTION OFFICE
BELTSVILLE, MD 20705

EXHIBIT C
(Wheat)

OBJECTIVE DESCRIPTION OF VARIETY
WHEAT (*Triticum* spp.)

NAME OF APPLICANT(S) South Dakota Agricultural Experiment Station	FOR OFFICIAL USE ONLY PVPO NUMBER 200500005
ADDRESS (Street and No. or RD No., City, State, and Zip Code) South Dakota State University Ag Hall 129 Brookings SD 57007	VARIETY NAME Granger
	TEMPORARY OR EXPERIMENTAL DESIGNATION SD 3546

PLEASE READ ALL INSTRUCTIONS CAREFULLY: Place the appropriate number that describes the varietal character of this variety in the boxes below. Place a zero in the first box (e.g. or) when number is either 99 or less or 9 or less respectively. Data for quantitative plant characters should be based on a minimum of 100 plants. Comparative data should be determined from varieties entered in the same trial. Royal Horticultural Society or any recognized color standard may be used to determine plant colors; designate system used: _____

Please answer all questions for your variety; lack of response may delay progress of your application.

1. KIND:

- 1=Common
2=Durum
3=Club
4=Other (SPECIFY): _____

2. VERNALIZATION:

- 1=Spring
2=Winter
3=Other (SPECIFY): _____

3. COLEOPTILE ANTHOCYANIN:

- 1 = Absent 2 = Present

4. JUVENILE PLANT GROWTH:

- 1 = Prostrate 2 = Semi-erect 3 = Erect

5. PLANT COLOR (boot stage):

- 1 = Yellow-Green
2 = Green
3 = Blue-Green

6. FLAG LEAF (boot stage):

- 1 = Erect
2 = Recurved

 1 = Not Twisted
2 = Twisted

 1 = Wax Absent
2 = Wax Present

7. EAR EMERGENCE:

<input type="text" value="0"/> <input type="text" value="3"/>	Number of Days (Average)	Chris	*
<input type="text" value="0"/> <input type="text" value="1"/>	Number of Days Earlier Than	Briggs	*
	Same as	Forge	*

* Relative to a PVPO-Approved Commercial Variety Grown in the Same Trial

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8. ANTER COLOR:

☐ 1 = Yellow
☐ 2 = Purple

9. PLANT HEIGHT (from soil to top of head, excluding awns):

☐ 8 ☐ 4 cm (Average) Briggs
☐ 0 ☐ 3 cm Taller Than _____ *

Same as _____ Forge _____ *

☐ 0 ☐ 9 cm Shorter Than _____ Chris _____ *

10. STEM:

A. ANTHOCYANIN

☐ 1 = Absent
☐ 2 = Present

B. WAXY BLOOM

☐ 1 = Absent
☐ 2 = Present

C. HAIRINESS

(last internode of rachis)

☐ 1 = Absent
☐ 2 = Present

D. INTERNODE

☐ 1 = Hollow 2 = Semi-solid 3 = Solid

☐ Number of Nodes

E. PEDUNCLE

☐ 1 = Erect 2 = Recurved 3 = Semi-erect

☐ 2 ☐ 0 cm Length

F. AURICLE

☐ 1 Anthocyanin 1 = Absent 2 = Present

☐ Hair 1 = Absent 2 = Present

11. HEAD (at Maturity):

A. DENSITY

☐ 2 1 = Lax
 2 = Middense (Laxidense)
 3 = Dense

B. SHAPE

☐ 1 = Tapering
 2 = Strap
 3 = Clavate
 4 = Other (SPECIFY): _____

C. CURVATURE

☐ 2 1 = Erect
 2 = Inclined
 3 = Recurved

D. AWNEDNESS

☐ 4 1 = Awnless
 2 = Apically Awnletted
 3 = Awnletted
 4 = Awned

12. GLUMES (at Maturity):

A. COLOR

- ☐ 1 = White
☐ 2 = Tan
☐ 3 = Other (SPECIFY): _____

B. SHOULDER

- ☐ 2 ☐ 1 = Wanting ☐ 2 = Oblique
☐ 3 = Rounded ☐ 4 = Square
☐ 5 = Elevated ☐ 6 = Apiculate
☐ 7 = Other (SPECIFY): _____

C. SHOULDER WIDTH

- ☐ 2 ☐ 1 = Narrow
☐ 2 = Medium
☐ 3 = Wide

D. BEAK

- ☐ 2 ☐ 1 = Obtuse
☐ 2 = Acute
☐ 3 = Acuminate

E. BEAK WIDTH

- ☐ 3 ☐ 1 = Narrow
☐ 2 = Medium
☐ 3 = Wide

F. GLUME LENGTH

- ☐ 2 ☐ 1 = Short (ca. 7mm)
☐ 2 = Medium (ca. 8mm)
☐ 3 = Long (ca. 9mm)

G. WIDTH

- ☐ 3 ☐ 1 = Narrow (ca. 3mm)
☐ 2 = Medium (ca. 3.5mm)
☐ 3 = Wide (ca. 4mm)

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13. SEED

A. SHAPE

- ☐ 2 ☐ 1 = Ovate
☐ 2 = Oval
☐ 3 = Elliptical

B. CHEEK

- ☐ 1 ☐ 1 = Rounded
☐ 2 = Angular

C. BRUSH

- ☐ 2 ☐ 1 = Short ☐ 2 ☐ 1 = Not Collared
☐ 2 = Medium ☐ 2 = Collared
☐ 3 = Long

D. CREASE

- ☐ 1 ☐ 1 = Width 60% or less of Kernel
☐ 2 = Width 80% or less of Kernel
☐ 3 = Width Nearly as Wide as Kernel

- ☐ 3 ☐ 1 = Depth 20% or less of Kernel
☐ 2 = Depth 35% or less of Kernel
☐ 3 = Depth 50% or less of Kernel

E. COLOR

- ☐ 3 ☐ 1 = White
☐ 2 = Amber
☐ 3 = Red
☐ 4 = Other (SPECIFY): _____

F. TEXTURE

- ☐ 2 ☐ 1 = Hard
☐ 2 = Soft
☐ 3 = Other (SPECIFY): _____

G. PHENOL REACTION (see instructions):

- ☐ ☐ 1 = Ivory ☐ 4 = Dark Brown
☐ 2 = Fawn ☐ 5 = Black
☐ 3 = Light Brown

H. SEED WEIGHT

- ☐ 3 ☐ 8 g/1000 seed (Whole number only)

I. GERM SIZE

- ☐ 3 ☐ 1 = Small
☐ 2 = Midsize
☐ 3 = Large

14. Disease : (0=Not Tested; 1=Susceptible; 2=Resistant; 3=Intermediate; 4=Tolerant)

PLEASE INDICATE THE SPECIFIC RACE OR STRAIN TESTED

<input type="checkbox"/> 2 Stem Rust (<i>Puccinia graminis</i> f. sp. <i>tritici</i>)	<input type="checkbox"/> 2 Leaf Rust (<i>Puccinia recondita</i> f. sp. <i>tritici</i>)
<input type="checkbox"/> 0 Stripe Rust (<i>Puccinia striiformis</i>)	<input type="checkbox"/> 0 Loose Smut (<i>Ustilago tritici</i>)
<input type="checkbox"/> 3 Tan Spot (<i>Pyrenophora tritici-repentis</i>)	<input type="checkbox"/> 0 Flag Smut (<i>Urocystis agropyri</i>)
<input type="checkbox"/> 0 Halo Spot (<i>Selenophoma donacis</i>)	<input type="checkbox"/> 0 Common Bunt (<i>Tilletia tritici</i> or <i>T. laevis</i>)
<input type="checkbox"/> 0 <i>Septoria nodorum</i> (Glume Blotch)	<input type="checkbox"/> 0 Dwarf Bunt (<i>Tilletia controversa</i>)
<input type="checkbox"/> 0 <i>Septoria avenae</i> (Speckled Leaf Disease)	<input type="checkbox"/> 0 Karnal Bunt (<i>Tilletia indica</i>)
<input type="checkbox"/> 3 <i>Septoria tritici</i> (Speckled Leaf Blotch)	<input type="checkbox"/> 0 Powdery Mildew (<i>Erysiphe graminis</i> f. sp. <i>tritici</i>)
<input type="checkbox"/> 3 Scab (<i>Fusarium</i> spp.)	<input type="checkbox"/> 0 "Snow Molds"
<input type="checkbox"/> 0 "Black Point" (Kernel Smudge)	<input type="checkbox"/> 2 Common Root Rot (<i>Fusarium</i> , <i>Cochliobolus</i> and <i>Bipolaris</i> spp.)
<input type="checkbox"/> 0 Barley Yellow Dwarf Virus (BYDV)	<input type="checkbox"/> 0 Rhizoctonia Root Rot (<i>Rhizoctonia solani</i>)
<input type="checkbox"/> 0 Soilborne Mosaic Virus (SBMV)	<input type="checkbox"/> 0 Black Chaff (<i>Xanthomonas campestris</i> pv. <i>translucens</i>)
<input type="checkbox"/> 0 Wheat Yellow (Spindle Streak) Mosaic Virus	<input type="checkbox"/> 0 Bacterial Leaf Blight (<i>Pseudomonas syringae</i> pv. <i>syringae</i>)
<input type="checkbox"/> 0 Wheat Streak Mosaic Virus (WSMV)	<input type="checkbox"/> Other (SPECIFY) _____
<input type="checkbox"/> Other (SPECIFY) _____	<input type="checkbox"/> Other (SPECIFY) _____
<input type="checkbox"/> Other (SPECIFY) _____	<input type="checkbox"/> Other (SPECIFY) _____
<input type="checkbox"/> Other (SPECIFY) _____	<input type="checkbox"/> Other (SPECIFY) _____

15. INSECT: (0=Not Tested; 1=Susceptible; 2=Resistant; 3=Intermediate; 4=Tolerant)

PLEASE SPECIFY BIOTYPE (where needed)

<input type="checkbox"/> 0 Hessian Fly (<i>Mayetiola destructor</i>)	<input type="checkbox"/> Other (SPECIFY) _____
<input type="checkbox"/> 0 Stem Sawfly (<i>Cephus</i> spp.)	<input type="checkbox"/> Other (SPECIFY) _____
<input type="checkbox"/> 0 Cereal Leaf Beetle (<i>Oulema melanopa</i>)	<input type="checkbox"/> Other (SPECIFY) _____
<input type="checkbox"/> 0 Russian Aphid (<i>Diuraphis noxia</i>)	<input type="checkbox"/> Other (SPECIFY) _____

15. INSECT: *Continued* (0=Not Tested; 1=Susceptible; 2=Resistant; 3=Intermediate; 4=Tolerant) **200500005**

PLEASE SPECIFY BIOTYPE (where needed)

☐ 0 Greenbug (*Schizaphis graminum*)

☐ Other (SPECIFY) _____

☐ 0 Aphids

☐ Other (SPECIFY) _____

16. ADDITIONAL INFORMATION ON ANY ITEM ABOVE, OR GENERAL COMMENTS

EXHIBIT D
Granger (SD3546)
Additional Descriptive Information

Release of 'Granger Hard Red Spring Wheat

'Granger' (SD8070/SD3165) is an early, tall semi-dwarf hard red spring wheat variety derived from an F₄ plant within a population created in the fall of 1993. It was tested as SD3546 within the South Dakota State University Advanced Yield Trials (AYT) from 2000-2003. In 2001-2003, Granger was also tested in both the Uniform Regional Spring Wheat Nursery (URSWN) and South Dakota Crop Performance Testing trials. Milling and baking properties associated with Granger were evaluated through inclusion in the 2003 Wheat Quality Council trials. Coverage under the United States Plant Variety Protection Act will be sought for Granger.

Major strengths of 'Granger' include:

- Consistently high yield potential
- Very large seed size
- Intermediate to superior *Fusarium* Head Blight resistance
- High stem rust resistance
- Moderate leaf rust resistance
- Exceptional milling and baking quality

During four years of inclusion in South Dakota AYT's, the average yield of Granger exceeded that of 'Russ' and 'Oxen' by 2.3 bushels per acre, and of 'Briggs' by 0.9 bushels per acre. It appears to be very well adapted not only to South Dakota, but also the three state (SD, ND, MN) spring wheat production region. Out of 37 entries tested within the 2001 and 2002 URSWN trials, Granger produced the fourth and sixth highest yield, respectively over all test locations. On average, Granger is 0.5 inches shorter than Russ and 0.5 inches taller than Briggs. Heading dates of Granger, Briggs, and Walworth are similar and generally vary by less than one-half day. At approximately 10,000 seeds per pound, Granger is a very large seeded variety.

Field evaluations conducted at St. Paul MN in 2001 showed that Granger ranked fourth most resistant out of 39 entries tested for *Fusarium* Head Blight (FHB) resistance. Similar tests conducted at Brookings from 2000-2003 revealed that its FHB resistance is moderately high and similar to that of 'Ingot'. Greenhouse tests have indicated that Granger is resistant to a composite of stem rust races prevalent within the region. Additionally, field plot observations have shown that Granger was moderately resistant to leaf rust races present at Selby SD, Fargo, Carrington, and Langdon ND in 2001 as well as those present at St. Paul, MN in 2003.

Throughout its four-year AYT evaluation period, tests carried out at the USDA Spring Wheat Quality Laboratory in Fargo, ND, revealed that milling and baking quality parameters associated with Granger were high. Wheat Quality Council evaluations performed in 2003 also revealed that its milling and baking characteristics are above average to excellent.

EXHIBIT D
Granger (SD3546)
Additional Descriptive Information

Table 5. Kernel quality characteristics of Granger (SD3546) Hard Red Spring Wheat compared with other entries included in the 2003 Uniform Regional Hard Red Spring Wheat Nursery grown at 12 locations within Minnesota, North Dakota, and South Dakota.

Table 6. Flour quality characteristics of Granger (SD3546) Hard Red Spring Wheat compared with other entries included in the 2003 Uniform Regional Hard Red Spring Wheat Nursery grown at 12 locations within Minnesota, North Dakota, and South Dakota.

Additional Information. Evidence of approval to use the name 'Granger' for SD3546.

Table 5. Kernel quality characteristics of Granger (SD3546) Hard Red Spring Wheat compared with other entries included in the 2003 Uniform Regional Hard Red Spring Wheat Nursery grown at 12 locations within Minnesota, North Dakota, and South Dakota.

Cultivar	TW lb/bu	1000 kwt (g)	Kernel Size		Whole Kernel		Ground Wheat - NIR		Wheat Ash 14%mb	Kernel Hardness NIR
			lg (%)	sm (%)	Protein 12%mb	Moist %	Protein 12%mb	Moist %		
01M88	61.58	27.97	41.50	10.83	13.06	9.82	13.20	9.00	1.64	50.80
01M96	62.57	32.55	67.08	2.33	15.03	9.79	14.67	9.02	1.62	71.49
2375	61.06	35.00	61.83	3.91	14.46	9.90	14.30	8.90	1.56	67.32
960404-03	60.67	30.25	59.16	4.41	14.30	9.84	14.13	8.98	1.59	62.76
9650356-15	61.56	32.24	61.25	3.75	14.21	9.77	13.99	9.10	1.59	62.01
98S0113-20	61.63	30.38	54.33	4.16	15.20	9.75	14.93	8.88	1.53	65.74
BW314A	61.00	32.50	57.08	4.16	15.53	10.32	15.06	9.00	1.55	73.10
BZ998-447W	56.88	37.73	74.58	3.25	14.37	10.50	14.09	8.88	1.61	60.10
CA-901-735	61.75	34.80	68.41	3.25	14.14	10.31	14.23	8.98	1.54	76.23
Chris	59.97	27.11	45.45	7.27	15.56	9.72	15.26	8.91	1.59	67.81
Keene	61.70	31.66	55.83	6.41	15.19	9.90	14.89	8.98	1.57	73.65
MN99436-6	61.44	29.83	45.58	6.66	14.85	9.81	14.51	8.91	1.56	64.20
MT9929	60.52	30.80	51.91	5.08	14.89	10.07	14.69	8.97	1.52	60.79
Marquis	59.91	29.15	51.50	6.16	14.70	9.49	14.44	8.84	1.63	65.65
N98-0286	59.86	34.21	67.25	3.41	14.20	9.91	14.14	8.90	1.58	67.65
N99-0107	60.61	29.95	48.08	6.58	14.61	10.07	14.32	8.94	1.55	69.58
N99-0241	60.00	31.73	67.25	4.16	14.40	10.03	14.14	9.00	1.51	64.10
N99-2234	61.44	31.94	58.08	4.00	15.82	10.00	15.29	9.04	1.60	73.41
ND741	61.81	32.42	68.66	4.08	15.09	10.12	14.85	8.92	1.59	72.50
ND747	63.95	31.99	63.66	3.66	15.54	10.33	15.34	8.95	1.62	71.56
ND751	62.52	31.55	65.16	3.41	15.19	10.10	14.69	8.90	1.50	59.42
ND800	61.80	32.50	69.50	3.50	14.75	10.31	14.74	8.82	1.56	71.59
ND801	62.80	30.75	60.08	4.75	15.09	10.20	15.04	8.87	1.51	80.41
NDSW0246	61.48	32.38	68.33	2.83	15.45	9.98	15.00	8.96	1.64	66.13
SD3540	61.20	32.03	59.41	4.58	14.30	9.61	14.15	8.86	1.53	69.83
SD3546	61.43	36.40	71.75	3.33	14.79	9.60	14.60	8.85	1.55	72.96
SD3618	61.11	33.29	62.66	4.16	14.28	9.75	14.08	8.92	1.55	70.70
SD3635	61.24	31.83	58.58	5.41	13.59	9.95	13.65	8.93	1.52	66.98
SD3641	60.94	32.71	62.25	3.08	14.66	9.88	14.30	8.95	1.48	60.23
Verde	60.08	31.91	68.08	3.66	14.17	10.11	14.09	8.92	1.56	71.38
Mean	61.16	31.98	60.47	4.54	14.71	9.96	14.49	8.94	1.56	67.67
Std Dev	2.05	4.30	23.66	5.14	1.71	1.57	1.45	0.52	0.16	8.19
Std Err	0.11	0.23	1.24	0.27	0.09	0.08	0.07	0.02	0.00	0.43

Table 6. Flour quality characteristics of Granger (SD3546) Hard Red Spring Wheat compared with other entries included in the 2003 Uniform Regional Hard Red Spring Wheat Nursery grown at 12 locations within Minnesota, North Dakota, and South Dakota.

Cultivar	Flour Extraction %	Flour Moist %	Flour Protein 14%mb	Flour Ash 14%mb	Mix Pat	Mix Peak (min)	Bake Mix Time (min)	Bake Abs %	Loaf Vol (cc)
01M88	50.53	13.90	11.91	0.41	1.58	13.10	3.67	53.48	193.00
01M96	56.38	13.96	13.57	0.34	2.75	8.90	3.54	55.76	211.75
2375.00	57.72	13.94	13.01	0.38	2.83	4.25	3.23	57.97	200.08
960404-03	57.70	13.88	13.27	0.38	3.25	8.46	3.60	56.43	197.67
96S0356-15	53.08	13.78	13.41	0.43	3.00	5.75	3.40	56.83	207.00
98S0113-20	54.02	13.74	13.98	0.38	3.08	4.63	3.08	58.10	208.75
BW314A	55.98	14.01	14.17	0.38	3.33	4.25	3.00	58.61	216.33
BZ998-447W	52.02	14.08	12.74	0.39	3.17	7.04	3.44	56.88	206.17
CA-901-735	55.56	14.09	12.78	0.37	3.75	9.08	3.71	57.96	188.92
Chris	57.29	13.83	14.46	0.38	2.64	4.36	3.07	57.76	211.18
Keene	56.09	13.85	13.68	0.36	3.42	4.17	3.19	58.98	214.42
MN99436-6	52.59	13.82	13.47	0.36	3.25	5.67	3.33	58.18	224.67
MT9929	53.85	13.93	13.90	0.35	3.08	4.83	3.08	56.52	218.83
Marquis	57.28	13.74	13.40	0.40	2.50	4.35	3.04	56.91	206.33
N98-0286	55.45	13.58	13.11	0.38	3.50	5.88	3.33	57.62	205.67
N99-0107	54.65	13.96	13.30	0.36	3.25	5.27	3.23	57.59	208.67
N99-0241	57.10	14.00	13.38	0.36	3.83	7.25	3.38	57.83	206.67
N99-2234	56.26	13.91	14.46	0.39	3.17	7.48	3.18	58.89	234.45
ND741	58.30	13.83	13.85	0.37	3.42	5.21	3.46	58.46	214.08
ND747	55.69	13.93	14.63	0.37	4.08	6.75	3.48	59.41	206.75
ND751	54.15	13.84	13.92	0.34	3.58	8.38	3.65	57.50	206.08
ND800	56.81	13.87	13.60	0.37	3.75	4.90	3.29	58.91	214.42
ND801	57.29	13.87	13.60	0.38	3.42	4.35	3.29	59.06	203.67
NDSW0246	55.34	13.79	14.33	0.36	3.42	5.29	3.25	58.48	231.92
SD3540	55.09	13.76	12.66	0.36	2.92	7.21	3.58	57.72	206.08
SD3546	58.18	13.81	13.38	0.38	3.42	4.54	3.21	60.00	209.92
SD3618	56.62	13.67	12.55	0.38	2.33	4.17	3.15	57.74	200.67
SD3635	58.47	13.96	12.20	0.37	2.67	5.96	3.46	57.20	199.50
SD3641	56.49	14.07	13.39	0.33	2.67	10.08	3.88	56.98	195.75
Verde	60.58	14.03	12.82	0.37	2.83	4.83	3.31	57.17	200.08
Mean	55.89	13.88	13.43	0.37	3.13	6.21	3.35	57.70	208.32
Std Dev	4.74	1.09	1.53	0.04	1.03	3.16	0.37	2.50	21.72
Std Err	0.25	0.06	0.08	0.00	0.05	0.17	0.02	0.13	1.15

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE

Application is required in order to determine if a plant variety protection certificate is to be issued (7 U.S.C. 2421). The information is held confidential until the certificate is issued (7 U.S.C. 2426).

EXHIBIT E
STATEMENT OF THE BASIS OF OWNERSHIP

1. NAME OF APPLICANT(S) SOUTH DAKOTA STATE UNIVERSITY AG EXPERIMENT STATION	2. TEMPORARY DESIGNATION OR EXPERIMENTAL NUMBER SD3546	3. VARIETY NAME GRANGER
4. ADDRESS (Street and No., or R.F.D. No., City, State, and ZIP, and Country) SDSU AG HALL 129 BROOKINGS, SD 57007	5. TELEPHONE (Include area code) 605-688-4149	6. FAX (Include area code) 605-688-6065
7. PVPO NUMBER 200500005		

8. Does the applicant own all rights to the variety? Mark an "X" in the appropriate block. If no, please explain.

☒ YES☐ NO

9. Is the applicant (individual or company) a U.S. national or a U.S. based company? If no, give name of country.

☒ YES☐ NO

10. Is the applicant the original owner?

☒ YES☐ NOIf no, please answer one of the following:

a. If the original rights to variety were owned by individual(s), is (are) the original owner(s) a U.S. National(s)?

☐ YES☐ NO

If no, give name of country

b. If the original rights to variety were owned by a company(ies), is (are) the original owner(s) a U.S. based company?

☐ YES☐ NO

If no, give name of country

11. Additional explanation on ownership (Trace ownership from original breeder to current owner. Use the reverse for extra space if needed):

PLEASE NOTE:

Plant variety protection can only be afforded to the owners (not licensees) who meet the following criteria:

1. If the rights to the variety are owned by the original breeder, that person must be a U.S. national, national of a UPOV member country, or national of a country which affords similar protection to nationals of the U.S. for the same genus and species.
2. If the rights to the variety are owned by the company which employed the original breeder(s), the company must be U.S. based, owned by nationals of a UPOV member country, or owned by nationals of a country which affords similar protection to nationals of the U.S. for the same genus and species.
3. If the applicant is an owner who is not the original owner, both the original owner and the applicant must meet one of the above criteria.

The original breeder/owner may be the individual or company who directed the final breeding. See Section 41(a)(2) of the Plant Variety Protection Act for definitions.

According to the Paperwork Reduction Act of 1995, an agency may not conduct or sponsor, and a person is not required to respond to a collection of information unless it displays a valid OMB control number. The valid OMB control number for this information collection is 0581-0055. The time required to complete this information collection is estimated to average 0.1 hour per response, including the time for reviewing the instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information.

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